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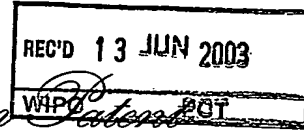
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Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,385,826, on May 10, 2002, by EARTH ANGEL INC., assignee of
John Phillip Brown, for "Cap for Attachment to a Barrel End and Storage Means
Therefor".

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ABSTRACT

A convex cap for removable attachment to a barrel end of projectile firing equipment such as the end of a gun barrel, purposed to protect the interior of the projectile firing equipment from foreign matter such as dust, dirt, debris and moisture wherein the cap is adapted to be in place on the barrel end at the time of firing. A means of storing caps is also provided.

CAP FOR ATTACHMENT TO A BARREL END AND STORAGE MEANS
THEREFOR

BACKGROUND OF THE INVENTION

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The present invention generally relates to the field of weaponry and more specifically to a means of protecting the interior of projectile firing equipment, including the barrel, from foreign matter such as dust, dirt, debris and moisture including that in the form of rain and snow.

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It is known in the art that debris and moisture in the barrel or other interior portions of projectile firing equipment can lead to malfunction thereof and/or physical and/or chemical degradation including corrosion. Furthermore, if firing equipment becomes plugged it may become susceptible to exploding.

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Other caps have been disclosed in the art such as in United States Patent No. 3,455,047 entitled "Muzzle Patch For Firearms" issued to Hoag on July 15, 1969. Hoag describes an adhesive patch which is pressed onto the tip of a muzzle of a gun to prevent dust and moisture from entering the barrel of the gun. The patch is made of a suitable plastic such as the material used to make Scotch (trade mark) tape and need not be removed prior to firing. The properties of this patch do not provide all of the advantages of the cap of the present invention. For example, the minimal strength of the patch fails to afford the protection provided by the cap of the present invention. Also, the patch is flat which fails to accomplish the distinct advantage realized by the present invention as will become apparent from this application in its entirety.

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SUMMARY OF THE INVENTION

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According to the present invention there is provided a cap for projectile firing equipment, comprising means to removably attach the cap to a barrel end of

projectile firing equipment, means to reduce or inhibit entry of moisture or debris into the barrel, means to allow the projectile firing equipment to fire a projectile without significant interference caused by the cap wherein the cap is blown completely off of the barrel, and means to allow the cap to be removably attached to a storage medium. These and other means are structurally provided by appropriate shape, size, and other characteristics of the cap. The size and shape of the protector are dependent on the barrel onto which the cap is to be placed. The cap may be of various sizes in order to be used with various types of barrels and numerous gauges and calibers of guns. Also, the cap may be used for double barrel guns and magazine wells.

The cap is of convex form which allows the cap to be effectively blown off the barrel upon firing. In contrast, a flat surface may blow off only in part leaving a portion attached to the barrel. The weight of the cap and the attachment characteristics ensure that the cap will not, to any substantial degree, affect the trajectory of the projectile.

The cap provides a substantially water- and air-proof seal to the projectile firing equipment. Also, the cap is adapted to remain in place if the projectile firing equipment is jarred. The cap is also resistant to puncture.

According to an aspect of the present invention, there is provided a convex cap adapted for removable attachment to a barrel end of projectile firing equipment and adapted to be in place on the barrel end at the time of firing of the projectile firing equipment. Although it is not necessary, in the least, for the cap to be removed from the barrel end prior to firing, the user may remove the cap without compromising the functioning thereof.

According to another aspect of the present invention there is provided a storage means which is adapted to receive at least one protector, preferably several. The caps may be readily removed from the storage means without any tools. The

caps, when removed from the storage means, are in a ready-to-be applied state.

BRIEF DESCRIPTION OF THE DRAWINGS

5 Figure 1 illustrates a barrel cap according to an embodiment of the present invention in place on a barrel;

Figure 2 illustrates the barrel cap of Figure 1 which has been released from the barrel;

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Figure 3 is a top plan view of the barrel cap of Figure 1;

Figure 4 is a bottom plan view of the barrel cap of Figure 1;

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Figure 5 is a side view of the barrel cap of Figure 1;

Figure 6 is a top plan view of the cap according to another embodiment of the present invention; and

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Figure 7 is a plan view of several caps on a storage case according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

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As shown in the figures, a barrel cap 1 according to an embodiment of the present invention is adapted to cooperate with the end of a barrel 2, for example, a gun barrel. The cap 1 is preferably annular, and more preferably circular. As shown well in Figure 5, the cap 1 comprises two main portions, an edge portion 5 and a convex portion 6. The edge portion 5 comprises adhesive such that the cap 1 may be removably adhered to the end of a barrel 2. Although these two cap portions are described herein as two portions, the present invention embodies

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both the configuration where these portions form one continuous structure and that where more than one structure forms the cap.

5 In a preferred embodiment, the edge portion 5 comprises an intermediate portion 7 and an adhesive portion 8. The intermediate portion 7 is made of a material which is compatible in the required conditions, including contact with the convex portion 6 and a barrel 2. The intermediate portion 7 is attached to the convex portion 6 and the adhesive portion 8. An example of a suitable material for the intermediate portion 7 is aluminum. The convex portion 6 is preferably plastic and
10 of a flexible nature such as the plastic used on a cap of a two litre plastic bottle. Therefore, as seen in the figures, the edge portion 5 comes in contact with the barrel end, and specifically the end surface of the barrel 2 perpendicular to the direction of firing.

15 Referring to Figure 2, when a projectile 3, for example a bullet, is fired by way of a barrel 2, air pressure 4 is created in front of the projectile. When the cap 1 is adhered to the barrel 2 the air pressure 4 exerts a force on the cap 1 causing the cap to become dislodged from the barrel 1 and released into the air. The thickness of the cap is preferably between approximately 1/8 in. and 1/64 in. and
20 more preferably approximately 1/32 in. The adhesive is preferably Tesa P (trademark) manufactured by BDF Beiresdorf of the United States and is such that once the cap is released from the barrel, the barrel is substantially clean of any residue of the cap or adhesive.

25 In a preferred embodiment the edge portion 5 comprises a tape made of aluminum foil having an adhesive on one side. This tape is preferably fused to the convex portion 6 during manufacturing.

30 In an alternative embodiment exemplified in Figure 6, the cap 1 comprises a tab 10 which permits the cap 1 to be readily removed from a barrel 2 or a storage means 11 as discussed below. The cap 1 is designed to be removable by the

user and this tab 10 is useful in this regard.

Referring to Figure 7, a storage means 11 is illustrated which is adapted to removably hold at least one and preferably several barrel caps, such as from 4 to 24 and preferably 12. The surface of the storage means is such that the caps 1 are held in place but can be removed by a user in a state which is ready for use and preferably comprises treated material such as waxed cardboard. In particular, the adhesive remains intact while on the storage means 11 and once removed therefrom. In a preferred embodiment the storage means is approximately 2-1/8" by 3-3/8" and stores 12 caps. The storage means is preferred so dimensioned to fit in a shirt pocket or wallet.

Before applying the cap 1 to a barrel 2, the inside of the barrel 2 may be substantially cleansed of any debris, oil or the like. Also, in order to improve the functioning of the protector, the end surface of the barrel 2 may be cleansed.

A preferred height of the convex portion 6 of the cap 1 is approximately 1/16" to 1/8" excluding the edge portion 5 which is preferably approximately 1/64". A preferred radius of curvature of the convex portion 6 is approximately 9/16" to 33/32". For instance, a cap 1 with a diameter of 1/2", which would be suitable for a 308 Remington, and a height of the convex portion 6 of 1/8" would have a radius of curvature of 9/16". Alternatively, if a height of the convex portion is 1/16" and the cap diameter remains the same at 1/2" the radius of curvature of the cap would be 33/32".

In a preferred embodiment the caps are a camouflage color in order to achieve the camouflage effect often desired when using projectile firing equipment. In an alternative embodiment, the cap includes a means for high visibility such as a means of luminescence such as a fluorescent composition.

In another embodiment of the present invention, registration numbers are provided on each cap in order to permit caps to be more readily tracked.

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A cap for removable attachment to a barrel end of projectile firing equipment which allows substantially unaffected firing of said projectile firing equipment, wherein said barrel end is perpendicular to a direction of firing of said projectile firing equipment, comprising:
 - a central convex portion which covers an aperture of said barrel end; and
 - a peripheral edge portion joined peripherally to said central convex portion and adapted to be removably attached, via an attachment means, to said barrel end and having a substantially similar form as said barrel end.
2. A cap according to claim 1 wherein said attachment means comprises an adhesive on said edge portion.
3. A cap according to claim 1 or 2 wherein said edge portion comprises an intermediate portion and an adhesive portion, wherein, when said cap is attached to said barrel end, said adhesive portion contacts said barrel end, and said intermediate portion lies between said adhesive portion and said convex portion, and wherein said intermediate portion is made of a material which is compatible with both said convex portion and said adhesive portion.
4. A cap according to claim 3 wherein said intermediate portion and said adhesive portion comprise a tape having said adhesive portion on one side thereof and said intermediate portion on an opposite side thereof.
5. A cap according to claim 3 or 4 wherein said intermediate portion is formed of aluminum.
6. A cap according to any one of claims 1 to 5 wherein said cap provides an air- and water-tight seal when said cap is attached to said barrel end.

7. A cap according to any one of claims 1 to 6 wherein said cap is resistant to puncture.
8. A cap according to any one of claims 1 to 7 wherein said cap comprises a tab for gripping by a user, wherein said tab, when said cap is attached to said barrel end, extends beyond said barrel end in a direction substantially perpendicular to said direction of firing of said projectile firing equipment.
9. A cap according to any one of claims 1 to 8 wherein said convex portion comprises a plastic material.
10. A cap according to any one of claims 1 to 9 wherein the height of said convex portion is from 1/16 to 1/8 inch.
11. A cap according to any one of claims 1 to 10 wherein said edge portion and said convex portion are circular.
12. A cap according to claim 11 wherein the radius of curvature of said convex portion is from 9/16 to 33/32 inch.
13. A cap according to claim 11 or 12 wherein the diameter of said convex portion is substantially 1/2 inch.
14. A cap according to any one of claims 1 to 13 wherein said cap is provided with a registration number thereon to identify the firing of the projectile firing equipment.
15. A cap according to any one of claims 1 to 14 wherein said cap comprises camouflage coloring.
16. A cap according to any one of claims 1 to 14 wherein said cap is luminescent.

17. A storage pad, comprising a substantially planar surface upon which one or a plurality of caps according to any one of claims 1 to 16 can be removably attached, said surface being so structured to removably hold said caps, such that said caps, when removed from said surface are ready for application to barrel end of a barrel.

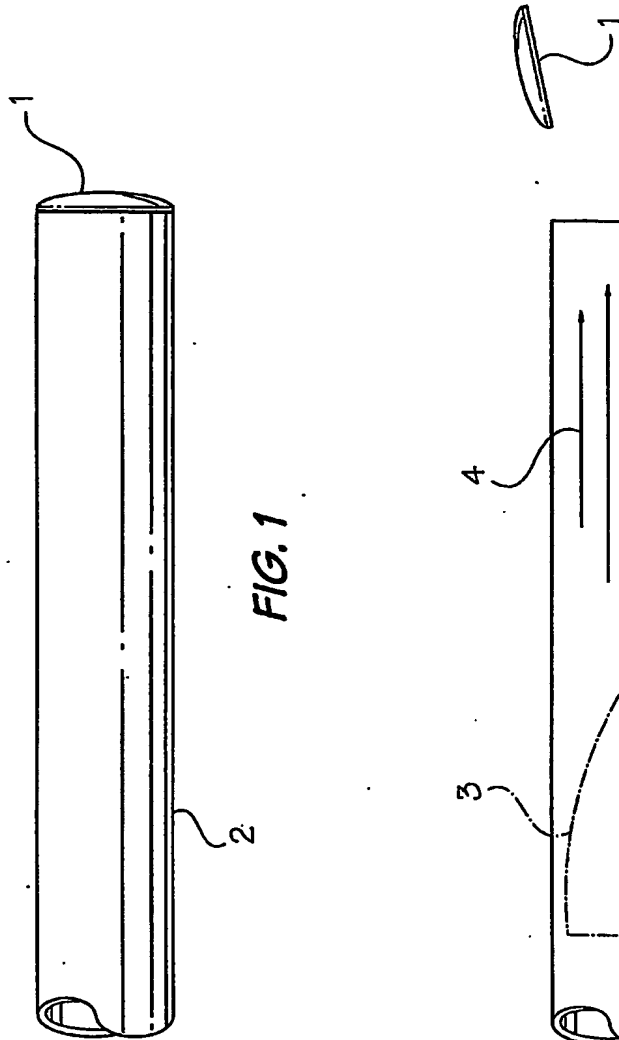
18. A cap for removable attachment to barrel ends of projectile firing equipment having multiple barrels, comprising:

- a plurality of convex portions capable of covering a plurality of apertures of said barrel ends; and

- a plurality of peripheral edge portions each joined peripherally to each of said plurality of said convex portions and adapted to be removably attached, via an adhesive attachment means, to said barrel ends;

- wherein said plurality of edge portions are contoured in substantially similar form as said barrel end.

19. A cap according to claim 18 wherein the projectile firing equipment comprises two barrels.



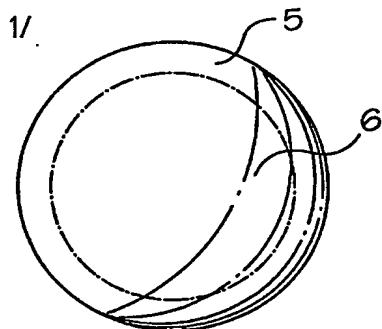


FIG. 3

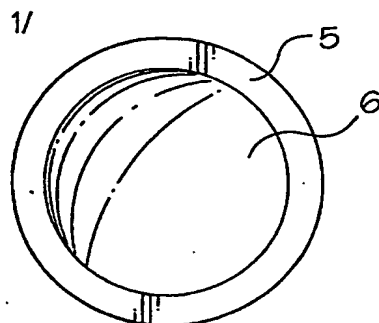


FIG. 4

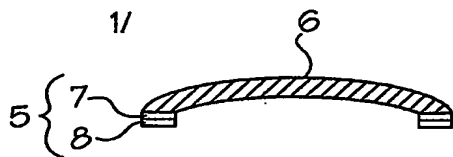


FIG. 5

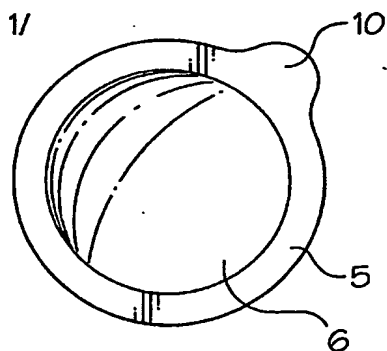


FIG. 6

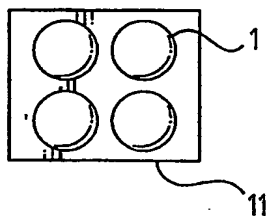


FIG. 7

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